CLAIMS

1. A method for calculating values for pixels of an image of an environment represented by geometric primitives that are defined by geometric data, the method comprising:

transforming the geometric primitives from a first coordinate space to a second coordinate space;

shifting a transformed primitive by a first sub-pixel offset;

rendering the shifted primitive to generate values for pixels of a first intermediate image;

shifting the transformed primitive by a second sub-pixel offset;

rendering the shifted primitive to generate values for pixels of a second intermediate image; and

combining the values for the respective pixels of the first and second intermediate images to determine the values for the pixels of the image.

2. The method of claim 1, further comprising writing the values for pixels of the first intermediate image to a first buffer and writing the values for pixels of the second intermediate image to a second buffer.

3. The method of claim 2 wherein either the first or second buffer comprises a z-buffer.

4. The method of claim 1 wherein the geometric primitive represents a strip of connected triangles.

5. The method of claim 1 wherein the geometric primitive represents a fan shaped set of connected triangles.

6. The method of claim 1 wherein the geometric primitive represents a set of disjoint triangles.

7. The method of claim 1 wherein shifting the transformed primitive by the first sub-pixel offset comprises shifting the transformed primitive to a sub-pixel location corresponding to a first sampling location of a sampling pattern.

8. The method of claim 1 wherein combining the values for the respective pixels of the first and second intermediate images comprises averaging the values for the respective pixels from the first and second intermediate images.

9. The method of claim 1 wherein combining the values for the respective pixels of the first and second intermediate images comprises weighting the values as a function of the respective offsets and combining the weighted values.

10. A method for calculating values for pixels of an image of an environment represented by geometric primitives, the geometric primitives defined by geometric data, the method comprising:

reading the geometric data;

setting-up the geometric primitives into a scene of the environment;

shifting one of the geometric primitives by a sub-pixel offset; and

rendering the shifted geometric primitive to generate values for pixels of a first intermediate image.

11. The method of claim 10 wherein shifting the geometric primitive by a sub-pixel offset comprises shifting the geometric primitive to a location corresponding to a sampling location of a sampling pattern, and the shifting and rendering of the geometric primitive is

repeated for each sampling location of the sampling pattern to generate values for pixels of a respective intermediate image.

12. The method of claim 11, further comprising combining the values for the respective pixels of the intermediate images.

13. The method of claim 12 wherein combining the values for the respective pixels comprises averaging the values for the respective pixels from the intermediate images.

14. The method of claim 12 wherein combining the values for the respective pixels comprises weighting the values as a function of the respective offsets and combining the weighted values.

15. The method of claim 10, further comprising writing the values for the pixels of the first intermediate image to a buffer.

16. The method of claim 10 wherein setting-up the geometric primitives comprises transforming the geometric data from a first coordinate space to a second coordinate space and generating scene geometry.

17. The method of claim 10 wherein shifting the geometric primitive by a sub-pixel offset comprises stochastically selecting the sub-pixel offset and shifting the geometric primitive by the selected offset.

18. A method for calculating values for pixels of an image of an environment represented by geometric primitives that are defined by geometric data, the method comprising:

transforming the geometric primitives from a first coordinate space to a second coordinate space; and

for each sampling location of a sampling pattern,

shifting a transformed primitive by a sub-pixel offset corresponding to a respective one of the sampling locations of the sampling pattern,

rendering the shifted primitive to generate values for pixels of a respective intermediate image, and

combining the values for the pixels of the intermediate images to determine the values for the pixels of the image.

19. The method of claim 18, further comprising storing the values for the pixels of each intermediate image in a respective buffer.

20. The method of claim 19 wherein at least one of the buffers in which the values for the pixels are stored comprises a z-buffer.

21. The method of claim 18 wherein combining the values for the pixels of the intermediate images comprises averaging the values for the respective pixels from the intermediate images.

22. The method of claim 18 wherein combining the values for the pixels of the intermediate images comprises weighting the values as a function of the respective offsets and combining the weighted values.

23. The method of claim 18 the sampling pattern includes at least two sampling locations.

24. A graphics system for calculating values for pixels of an image of an environment represented by geometric primitives, the geometric primitives defined by geometric data, the system comprising:

a primitive set-up engine for reading the geometric data and generating transformed geometric data therefrom, the transformed geometric data representing the geometric primitives set-up in a new coordinate space;

a rendering stage coupled to the primitive set-up engine to receive the transformed geometric data for a geometric primitive, shift the geometric primitive a sub-pixel offset, and calculate values for pixels representing the shifted geometric primitive; and

a buffer coupled to the rendering stage into which the values for the pixels calculated by the rendering stage are stored.

25. The graphics system of claim 24 wherein the rendering stage shifts the geometric primitive a sub-pixel offset and calculates values for pixels representing the shifted geometric primitive for each sampling location of a sampling pattern, the respective sub-pixel offsets by which the geometric primitive is shifted corresponding to the location of a respective sampling location.

26. The graphics system of claim 25, further comprising additional buffers, the number of which is equal to one less than the number of sampling locations.

27. The graphics system of claim 26, further comprising a combining circuit coupled to the buffer and any additional buffers to combine the values for the pixels of the different buffers to determine the values for the pixels of the image.

28. The graphics system of claim 27 wherein the combining circuit combines the values for the pixels of the buffer and any additional buffers by averaging the values for the respective pixels from the intermediate images.

29. The graphics system of claim 27 wherein the combining circuit combines the values for the pixels of the buffer and any additional buffers by weighting the values as a function of the respective offsets and combining the weighted values.

30. The graphics system of claim 24 wherein the rendering stage includes a primitive buffer for storing transformed geometric data and the geometric primitive comprises a strip of connected triangles.

31. The graphics system of claim 24 wherein the rendering stage includes a primitive buffer for storing transformed geometric data and the geometric primitive comprises a fan shaped set of connected triangles.

32. The graphics system of claim 24 wherein the rendering stage includes a primitive buffer for storing transformed geometric data and the geometric primitive comprises a set of disjoint triangles.

33. A graphics system for calculating values for pixels of an image of an environment represented by geometric primitives, the geometric primitives defined by geometric data, the graphics system comprising a multi-stage processing pipeline transforming the geometric data from a first coordinate space to a second coordinate space, and for each sampling location of a sampling pattern, shifting a transformed primitive by a sub-pixel offset corresponding to a respective one of the sampling locations of the sampling pattern and rendering the shifted primitive to generate values for pixels of a respective intermediate image, the multi-stage processing pipeline further combining the values for the pixels of the intermediate images to determine the values for the pixels of the image.

34. The graphics system of claim 33 wherein the multi-stage processing pipeline further stores the values for the pixels of each intermediate image in a respective buffer.

35. The graphics system of claim 33 wherein the multi-stage processing pipeline combines the values for the pixels of the intermediate images by averaging the values for the respective pixels from the intermediate images.

36. The graphics system of claim 33 wherein the multi-stage processing pipeline combines the values for the pixels of the intermediate images by weighting the values as a function of the respective offsets and combining the weighted values.